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EPISTEMOLOGY AND THE NEW WAY OF WORDS[1]

I

THE general perspective of the present paper can best be indicated by saying that the author is a rationalistic realist who has deserted to the camp of logical empiricism; but who feels that in doing so he has not so much rejected one set of philosophical propositions in favor of another, as come to a clearer understanding of what philosophical propositions *are*. This change of allegiance has been made possible by the development of the semantic phase of the pure theory of languages; for only with the achievements of pure semantics did the formal-linguistic approach to epistemological and metaphysical issues begin to appear *relevant*, let alone adequate.

Today it is generally recognized that the tools of the syntactical phase of logical empiricism were not up to the task of dealing with all genuinely philosophical issues. That the situation has been improved by the addition of the semantic dimension to the pure theory of languages, is clear. Yet to the question, "Are we yet in possession of the tools necessary for a systematic clarification of philosophical issues?" the answer, as I shall indicate, must be in the negative. I shall argue that philosophy is properly conceived as the *pure theory of empirically meaningful languages*, and that pure semantics, as it now exists, is but a fragment of such a theory.

It is hardly necessary to point out that the additional tools for which we are looking are not to be found in the development which has come to be known as "pragmatics," for this is, on the whole, a branch of empirical science, a focusing of psychology and sociology on the phenomena subsumed under the empirical concept of language. I say "on the whole," because philosophers who work in this field often adumbrate certain issues of a genuinely epistemological character which can not be handled in terms of current syntactic or semantic categories. Unfortunately, since these issues are adumbrated in a socio-psychological context, they are inevitably falsified and confused with empirical problems. Even more unfortunate is the fact that because the felt need for a *philo-*

[1] A revised edition of a paper read at the meeting of the Western Division of the American Philosophical Association at Iowa City, May, 1947.

sophical supplementation of semantic categories is thus finding expression along empirical-psychological lines, there is occurring a psychologistic infection of these semantic categories themselves. The result is a blurring of the sharp distinction between philosophical and factual propositions which was a primary value of the syntactical phase of logical empiricism, whatever its shortcomings in other directions. It is by the proper supplementation of contemporary semantic categories that this infection is to be overcome. This supplementation, then, must serve two functions: (1) It must make possible the development of a system of concepts in terms of which all genuinely philosophical questions can be given an adequate formulation. (2) It must lead to a clarification of the very distinction between philosophical and empirical concepts, so that we can understand what it means to say that questions involving philosophical concepts are answered on *a priori* rather than empirical grounds.

The present paper amounts to the contention that classical rationalism, in so far as it was concerned with genuinely philosophical issues, made explicit the grammar of epistemological and metaphysical predicates, but—owing to certain confusions, particularly with respect to *meaning* and *existence*—came to the mistaken conclusion that philosophical statements were factual statements, albeit of a peculiar kind. Classical empiricism, on the other hand, argued that these statements were common or garden variety factual statements, and usually put them in the psychological species. Rationalism gave the grammar, but contaminated it with platonizing factualism. Classical empiricism threw out the platonizing, but continued to factualize, and confused the grammar of philosophical predicates by attempting to identify them with psychological predicates. In many cases the grammar was so seriously confused that certain of the more consequent empiricists can hardly be called philosophers.

It is now time to realize that classical rationalism was essentially sound as a naïve syntax of philosophical predicates, and not only can but must be absorbed into the empiricist camp if the latter is to be a philosophy. As a matter of fact, such a process of absorption has been going on for some time, and is proceeding, according to all indications, at an accelerated rate.[2] The essential task is to rob rationalism of the illusion that it is making factual statements. But in order to do this, empiricism must first recognize that a certain group of concepts which, when they are recognized at all to fall within the province of the philosopher, are

[2] These lines were written before the appearance of Carnap's *Meaning and Necessity*, which constitutes an excellent example of this trend.

hurled into the psychologistic dump known as pragmatics, are as genuinely philosophical and non-factual as those of pure syntax. Empiricism, too, has its factualistic illusions to lose. Thus the conflict between rationalism and empiricism is a conflict of illusions, and must cease when these factualistic illusions are dispelled. *An empiricism which recognizes that empiricism is not an empirical thesis will be identical with a rationalism which recognizes that rationalism is not a factual thesis.*

The central thesis of this paper can be put by saying that the system of predicates involved in the pure theory of empirically meaningful languages is inadequate so long as it fails to include a family of predicates among the elder members of which are "verified," "confirmed," "type," "token," "meaningful," "world-story." Our aim will be to sketch a grammar which throws new light on these terms by explicating their relation to one another and to the predicates explored in recent semantic and syntactical studies. In attempting to make explicit the syntax of epistemological predicates, we shall make use of the Wittgensteinian device of speaking in terms of a perfect language. For reasons which will become apparent as we proceed, we shall conceive of this language as the language of an omniscient being. If, in illuminating the concept of omniscience, we can show that epistemological predicates, particularly those which are almost invariably given a psychologistic treatment, play a purely formal rôle, then it would remain to draw the implications for the grammar of these predicates of the distinction between perfect and imperfect languages. *That this distinction has no consequences whatsoever for the grammar of epistemological predicates is, from the standpoint of philosophy, the most illuminating insight of all.*

II

In exploring the grammar of epistemological predicates, one of the most fruitful reference points is the fact that it makes sense to say that our language permits us to speak not only about this or that individual, but also about *all* individuals. Thus it makes sense to say that the sentence "All swans are white" says of each item in the universe that either it is white, or else it is not a swan. It is not always realized that this train of thought leads to the conclusion that it makes sense to say that the language in which "All swans are white" is formulated contains a designation for every constituent ingredient of the world to which it refers. In other words, if we permit ourselves to be guided by the grammar of the term "all," we are led to the notion of this language as mirroring the world by a one-to-one correspondence of designations with indi-

viduals. A similar train of thought applies to the case of universals or classes. While it is obvious that the English language as belonging to the empirical class determined by the socio-psychological concept of language does not have such an omni-mirroring character, it is equally clear that when we view language in the perspective of epistemological predicates, we treat it as though it were adequately tailored to a world.

Let us call our omniscient being Jones, his language the Jonesean language, and the body of logically simple (atomic) sentences which constitute the story of the universe in which he lives, the Jonesean world-story. Now it is a direct implication of the omniscience of Jones that the sentences of the Jonesean world-story *mean* states of affairs in the world,[3] and are *true*. Instead, however, of exploring at this point the syntax of "meaning" and "truth," we shall take a roundabout way which, as in the adage, will prove the shortest way home. Thus, we note that the Jonesean language permits the formulation of *false* sentences, that is to say, of sentences which are incompatible with sentences belonging to the Jonesean world-story, and indeed, *it would seem*, of a whole set of alternative world-stories, only one of which is true. The concept of the omniscience of Jones involves not only that of a discrimination on his part between the true and the false sentences of the language, but also the notion that this discrimination is *well-founded* or *justified*.[4]

Let us take another look at the Jonesean world-story. It occurs to us that since it speaks about everything, it must mention Jones. That is to say, it must include sentences which constitute the biography of Omniscient Jones, and, in particular, the biography of his immediate experience (hereinafter called the Jonesean datum-biography[5]). This suggests that the justifiability of the selection

[3] Until we become clear about the grammar of the term "world" in such a context, we shall sometimes speak of *the world of Jones*, and sometimes of *the world* without qualification. In general, our use of any philosophical term will be tentative and dialectical until the group grammar of all fundamental terms shows forth, at least in outline.

[4] I share the conviction that all justification in the epistemological sense of the term is ultimately analytic in character. That the justification of which we have begun to speak is epistemological, and hence analytic, it is the specific purpose of this paper to establish.

[5] In order to explicate the grammar of epistemological predicates, we need to consider them in use, that is to say, as applied to the expressions of an object language. Omniscient Jones is merely a device for blowing up our ordinary use of epistemological predicates into their use in the context of a perfect language. Since one of our conclusions will be that there is no epistemological problem of realism, we shall be begging no epistemological issues if we operate on the assumption that the Jonesean world-story includes other sentences than those belonging to the Jonesean datum-biography.

by Jones of certain sentences in the language as true, and as constituting the story of the world, rests on the fact that the selected group of sentences includes the Jonesean datum-biography, *includes*, that is to say, *sentences the meanings of which are exemplified in his immediate experience*. In other words, if it made sense to say that Jones's experience includes both the *meanings* of datum-biographical sentences, as well as the data which embody those meanings, then we might well be satisfied that it is in the notion of a direct comparison of datum-biographical meanings with the data themselves that is to be found the basis for an account of the justification of the selection of certain sentences in the language as the *true* sentences of the language. This is the line taken by the modern platonist, for whom "immediate experience" has a broader sense in which it includes universals and propositions as well as the customary narrower sense in which it is limited to certain particular states of affairs. This line, however, is not open to the empiricist, for whom meanings are never data.[6]

As empiricists we must fall back at least temporarily on the fact that if meanings are never data, this is not true of *linguistic expressions*. Indeed, since the use of a language involves the occurrence in the world of tokens[7] of expressions belonging to the language, it occurs to us that the immediate experience of Jones must include tokens of the sentences of the Jonesean language, and, in particular, tokens of the sentences which make up the Jonesean world-story. This leads to the conclusion that Jones's immediate experience must include tokens of the sentences which make up the Jonesean datum-biography. Thus, while we do not have an experiential confrontation of the meanings of these sentences with

[6] That meanings in the sense defined by empirical psychology are not data is obvious. (For an account of meaning as psychological fact which brings out the dispositional character of the psychological concept of meaning, see Charles Stevenson's *Ethics and Language*, Chap. III, particularly sections 4 and 5.) However, we must also recognize a use of "meaning" which is distinct from that of empirical psychology, even if in some sense it is a "reconstruction" of it. This is the sense which is relevant to the semantic analysis of epistemological predicates. It is the recognition of this sense which leads only too often to Platonism. The contention that it is nonsense to speak of meanings in this sense as data constitutes the essential difference between an empiricism which reformulates the insights of Platonism, and Platonism itself. The characteristic tenets of Platonism, as opposed to a sound logical or epistemological realism with respect to universals and propositions, spring from the nonsense of speaking of apprehending universals and propositions.

[7] We shall distinguish below (pp. 653–654) between a linguistic token, a class of linguistic tokens, and a linguistic type (that is to say, between *token*, *token-class*, and *type*). For the moment it will be sufficient to think of a token as a member of a class of marks as having meaning.

the realizations of these meanings, we do have an experiential confrontation of certain tokens of the sentences with the states of affairs to which they refer.

Let us define a *verified* sentence as *a sentence a token of which is co-experienced with its designatum.* We can then suggest that the notion of the justifiability of the selection of certain sentences in a language as constituting the story of the world [8] rests on the notion that certain sentences in the language are verified sentences. But since *ex hypothesi* [9] not all the true sentences of the language are verified sentences, *the notion of such justifiability presupposes the notion that there is a rational connection between the verified sentences and the other true sentences making up the Jonesean world-story such that the verified character of the former entails the truth of the latter.* Can we make sense of the concept of rational connection in this context?

We have suggested that classical rationalism may yet have a contribution to make to an empiricist epistemology, provided that factualistic illusions are set aside. How then would the rationalist verbalize on this point? Somewhat as follows (if we pick and choose from the history of rationalism). He appeals to an *a priori* principle of supplementation, the principle of sufficient reason, which is bound up with the existence of a realm of universals so related to one another that they constitute a system which can be viewed in one light as a system of necessary connections, and in another as a system of compossibilities. (It is this system which underlies the concept of the laws of nature.) Thus, in answer to the question we raised in the preceding paragraph, the rationalist might be expected to say, "Omniscient Jones justifies his selection of a group of sentences as those which are true of his world and constitute its story, by reference to the fact that this group includes a sub-set of verified sentences,[10] the meanings of which are propositions known to require supplementation by reference to the principle of sufficient reason, and which, given the structure of the domain of universals meant by the predicates of the language, can be supplemented in only one way to make a complete world story." We are suggesting that a de-phlogisticated verbalizing along these lines may find a place in an adequate empiricist epistemology.

But the empiricist would seem to be confronted by a dilemma at the very beginning of an attempt to speak along these lines. In order to hold that one set of *atomic* sentences can be compatible

[8] See footnote 3 above.

[9] See footnote 5 above.

[10] For the rationalistic account of a verified sentence we must return to the approach we formulated, only to reject, on p. 649 above.

(and it is logical, not psychological, compatibility that is in question) with only one set of additional *atomic* sentences, he must make sense of the notion of *a priori* (that is, for the empiricist, *logical*) restrictions on the manner in which atomic sentences can combine—restrictions which are functions of the predicates appearing in these sentences. On the other hand, the notion of such restrictions is repugnant to the contemporary empiricist, for whom no two atomic (and therefore affirmative) sentences can be incompatible.[11] We notice that on the rationalistic position, universal propositions which correspond to a connection of universals are synthetic *a priori* truths about a world exemplifying those universals. Our problem, then, amounts to that of determining what concessions[12] can be made within the framework of empiricism to the notion of synthetic *a priori* truth. Needless to say, any concessions along these lines must be made by showing that the notion of the synthetic *a priori* is the confused notion of an *a priori* that is *analytic*. The terms of our problem, however, prohibit a solution along traditional empiricist lines, for it follows from the above that the universal sentences which express, for the rationalist, eidetic intuition on the part of Omniscient Jones, are synthetic in the usual syntactic sense. If an analytic *a priori* is involved, it can only be on condition that it makes sense to say that *the statement that certain synthetic universal sentences are true of the world, is itself analytic*.[13]

III

How can it be an analytic proposition that certain synthetic universal propositions are true of the world? Here is where empiricism must abandon its naïve realism. The first step consists in

[11] He reluctantly makes an exception for atomic sentences in which determinate predicates falling under the same determinable are predicated of the same individual. This concession, however, does not touch our problem, which concerns the compatibility of atomic sentences about different individuals. To say this, however, is not to say that in so far as additional types of restrictions on the combining of atomic sentences must be recognized, they are unrelated to that which is so reluctantly conceded.

[12] To add, as we must, that in the final analysis we have to do not with concessions, but with a necessary ingredient in an empiricist epistemology, is to restate our contention that the rationalism-empiricism issue is a pseudo-problem.

[13] It is worth noting that for the Platonist it is an analytic truth that synthetic universal propositions corresponding to connections of essences are true of the world embodying those essences. Is it silly to ask, "Might there not be other worlds embodying other realms of essence, so that the synthetic *a priori* propositions actually lived up to by the first world would be only vacuously satisfied by the others, and vice versa?" *Autre pays, autres moeurs?* Here we have a hint as to the direction our argument will take.

examining the rôle of the definite article in the expression "*the* world." Since the very function of the definite article is to imply a set of entities from which one is distinguished, must we not say that the distinction between *the* world and the other worlds is a descriptive one? "But surely," it will be said, "the others don't exist!" Here is the germ of the ontological fallacy. It is now time to realize that every world-story means a world; that the basic grammar of the term "world" is brought out by the statement, "A world-story in a language means a world." It is in terms of this matrix that the expression "the world" is to be understood: "the world meant by. . . ." Thus, to understand the notion of *different worlds,* we must understand those of *different stories* and *different languages.* But it is best to begin with the simpler question, "In virtue of what are two predicates of one and the same language different?" Clearly, the difference has to do with a difference of meaning. At this point the danger is psychologism, the confusion of the *epistemological* predicate "means" with the predicate "means" which belongs to the vocabulary of empirical psychology.[14] We are arguing that statements about the meaning of terms are, in epistemological contexts, non-factual statements which are true or false in a purely formal sense, and decidable (in principle) on purely formal grounds. Not merely is a language characterized by a set of formation rules; we must also add that the primitive predicates of a language are distinguished from one another by *conformation* rules; rules which restrict the formation of compound sentences out of atomic sentences which involve these predicates. I have put the matter elsewhere[15] as follows:

> . . . consider the question: in virtue of what are two different predicates "ϕ" and "θ" different? We might be tempted to say either (1) because they are empirically different marks, or (2) because they have different meanings. The first answer is obviously inadequate. The second is more satisfying. But once we have drawn a sharp distinction between *meaning* as a concept of

[14] It is not denied that "means" in certain contexts is an empirical predicate. We are merely insisting that the epistemological and the psychological uses of the term be sharply distinguished. We shall follow current practice below and use the term "designates" in epistemological contexts, unless the context makes it clear which sense we have in mind. We are suggesting that "designates" is a purely formal term which no more stands for a feature in a world than do "implies" or "and." No one, today, would make the mistake of supposing that syntactical predicates are empirical or factual predicates; that "or," for example, stands for a feeling of "or-ness." Perhaps it is safer to say that no one should make such a mistake. If psychologism in syntactics shows some signs of rising from the dead, it is because psychologism in semantics has not been properly buried.

[15] "Realism and the New Way of Words," *Philosophy and Phenomenological Research,* forthcoming.

empirical psychology and *meaning* or *designation* as a concept of epistemological semantics, we see that though the second answer is true it does not clarify. The question asked above can no longer be characterized as a psychological side-issue, *but must be answered in terms appropriate to the conception of meaning or designation as a purely formal concept.* The conclusion at which we are arriving is that from the standpoint of epistemological analysis, the predicates of a language are differentiated from one another in terms of the formal roles they play in the language. Using the term "syntax" in a broader sense than is current, we could say "different syntax, different predicate; same syntax, same predicate." We shall prefer to say that predicates are differentiated only by the conformation rules which specify their combining properties. The concept of combining properties of predicates . . . concerns the relation of predicates to individual constants in the following way. It involves (1) the concept of a "skeletal" relational predicate (there may be more than one provided they are syntactically related) which signifies the fundamental type of order in which the individuals to which the language can refer must stand; (2) the concept of restrictions on the non-relational predicates which can be associated with given individual constants where the restrictions are a function of (a) the predicates, (b) the (skeletal) relational sentences in which these individual constants are making an appearance. . . . We have here a coherence theory of meaning characterized in purely syntactical terms. . . . It is in terms of such conformation rules that predicate families are formally specified (determinates under common determinables) and different predicate families are distinguished and related.

Thus, the formal concept of *designation* is essentially bound up with that of *conformation rule.* The identity of formally indiscernible predicates (we shall discuss individual constants in a moment) is part of the grammar of formal science, and, in particular, of the predicate "designates."

A further clarification of this point is contributed by the type-token distinction. Here it may be helpful to think of a linguistic type as a *nexus* of formal functions. The fact that in *mentioning* a linguistic type we must *use* an empirical mark makes it seem inevitable that the notion of a linguistic type is the notion of an empirical class as designating. Yet empirical classes belong to a world; and, as we have seen, the concept of a world is the correlate of the concept of a language semantically interpreted. For this reason, the concept of a language can not be identified with the concept of empirical classes as bearers of the designation relation. Empirical classes must be conceived as designators in a derivative sense.[16] The notion of such derivative designators is an essential ingredient in the concept of an empirically meaningful language as one that is used in the world it is about. We must thus distinguish between (1) types, (2) token-classes, and (3) tokens. The

[16] In the case of *meaning* as a psychological concept, on the other hand, the primary sense has to do with the empirical functioning of particular empirical marks in a constituted world.

metalinguistic predicates "type" and "token" presuppose "designates," and can be explicated as follows:

The predicate "token" is used properly when it is said that the *designatum* of one expression in a language is a token of another (perhaps the same) expression in the language. The formal significance of the concept of *token* is brought out by the following: If "*p*" designates *p*, and *p* is a token of "*q*," then all the metalinguistic predicates which apply to "*q*" apply also to *p*; thus, "'*q*' is true" entails "*p* is true." In other words, we have here a grammar according to which metalinguistic predicates can be associated in specifiable circumstances with the expressions belonging on either side of the predicate "designates." If *p* is a token of "*q*," then "*q*" is said to be the *type* of which *p* is a token.

It is involved in the notion of an empirically meaningful language that tokens be specified for the type expressions which make up the language. This is done by specifying for each type expression in the language the class (or classes [17]) of items in the world of the language which is to be the token class (or classes) for that expression.

IV

The ingredients we have so far introduced into the grammar which is to clarify the concept of an empirically meaningful language are essentially familiar, and, except for certain implications we have drawn, do not take us beyond the scope of the formal theory of languages as at present conceived. In order, however, to give a formal account of the predicates "verified," "confirmed," "meaningful," and, consequently, in order to complete the grammar of "truth," we must characterize a further restriction on the language to the expressions of which these predicates can apply. Such languages must contain a reflexive, symmetrical, and transitive two-place predicate for which we shall use the term "coex," but which must no more be confused with the predicate "co-experienced with" as a term of empirical psychology than "designates" with "means" as a psychological expression (though in each case it is proper to say that we are dealing with a "formal reconstruction" of language as empirical fact). The formal significance of "coex" lies (1) in its relation to the concept of *token*, linguistic tokens in a primary sense falling in the domain of the relation *coex*, and (2) in its relation to the concept of *verified sentence*, which will be defined below.

[17] Thus, from the standpoint of the pure theory of empirically meaningful languages, "different languages used in the same world and which mean that world" are to be understood as different sets of token-classes for the type expressions which constitute one and the same empirically meaningful language. (I note that Rynin, in the interesting essay which accompanies his edition of Johnson's *Treatise on Language*, arrives at a similar conclusion.)

We have argued that the meanings of the (primitive) predicates of a language are formally specified in terms of conformation rules which discriminate between them in terms of the structures of relational sentences (involving the "skeletal" or basic ordering relations of the language) in which individual constants must function in order for these predicates to be properly applied to them. What are we to say about the meanings of the individual constants of a language? *Once again the rejection of psychologism forces us to say that the difference in meaning of individual constants must rest on syntactically characterizable differences in their rôles in the language.* Is it sufficient to say that the individual constants of a language are differentiated in terms of a structure of basic order sentences which might be called the meaning-base of the individual constants of the language; a different individual constant (as type) corresponding to each place in the net-work?[18] This, however, would be a dangerous half-truth. It makes the relation between the individual constants and the primitive one-place predicates of a language a purely external one; it regards the individual constants (given the skeletal relations) as semantically self-sufficient. That the relation is not a purely external one we have already seen from the side of the one-place predicates. That the dependence is reciprocal is indicated by the following train of thought: (1) It will be granted that it doesn't make sense to speak of individuals which stand in relations, but have no qualitative character. Consequently the semantic aspect of individual constants does involve a reference to one-place predicates. (2) It follows (given our syntactical approach to semantic meaning) that for an individual constant in a language to have meaning involves that it be formally specified as belonging with a one-place predicate. (3) The only alternative to admitting that the semantic determinateness of the individual constants of a language presupposes a specific assignment of one-place predicates as defined by conformation rules, is to postulate one or more one-place predicates which belong to all individual constants, which one-place predicates are independent of the spectrum of one-place predicates defined by conformation rules. (4) This alternative (besides being open to all the classical objections to absolute space and time and to the ether) is incompatible with the fact (which I shall not argue in this paper) that the primitive individual constants of a logically perfect language can be connected in a true sentence with only one primitive, determinate, one-place predicate.[19]

[18] This is the approach suggested by Carnap in *Meaning and Necessity.*

[19] A developed theory of language must draw a clear distinction between primitive individual constants (simple individuals) and defined individual

The sum and substance of these contentions is that the meanings of the individual constants of a language must be specified in terms of a specific assignment to them of one-place predicates in conformity with the conformation rules relating to these predicates. *The meaning-base of the individual constants of an empirically meaningful language must be a complete world-story formulated in that language, rather than a pure structure of skeletal relations.* We must now rebuild this notion from a different perspective.

Let us return to the notion of a world-story, and, in particular, to that of a world-story the characterization of which as true is rationally warranted by the fact that it includes a sub-set of verified sentences which uniquely determine the world-story as a whole.[20] Let us call such a story a *confirmed*[21] world-story, and any sentence of such a story, a confirmed sentence. We can explicate the concept of such a world-story as follows:

A confirmed world-story is a set of sentences which, given the conformation rules which specify the meanings of the predicates of the language in which it is formulated, and given a semantically determinate battery of individual constants, contains a sub-set of sentences (1) which can be built into only this one complete story, (2) the *designata* (see paragraph which follows this explication) of which sub-set constitutes a set of items mutually related

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constants (complex individuals, "things"). Not even complex individuals can be members of more than one class or (*which is the same thing*) instances of more than one universal. "(x) $x \epsilon$ White $\rightarrow x \epsilon$ Circle" says "Each member of a *thing-class* including the note White is a member of a *thing-class* including the note Circle."

[20] The conception that, given the syntax *including conformation rules* of the language in which they are formulated, a set of verified sentences can formally entail and be entailed by a complete world-story, and thus be *logically equivalent* to that story, *without the story being translatable into*—or "reducible" to—*the set of verified sentences*, is what distinguishes my position from positivism. Compare the discussion of a *reciprocal fix* in my article "Pure Pragmatics and Epistemology," *Philosophy of Science*, Vol. 14 (1947), pp. 189 ff.

[21] This root sense of "confirmed" is not one that admits of degrees. Its function is to clarify the contrast between sentences "checked against the facts they assert" (verified sentences) and sentences "checked only indirectly" (confirmed but not verified sentences). A predicate "confirmed-to-degree-n" relates not to this distinction, but to the clarification of statistical and probability assertions. Such a predicate might be introduced as one applicable to expressions in a language L, and defined as a matter of the ratios in which the individual terms (appearing in a story S which is the meaning-base of L) which satisfied one sentential function, also satisfied other sentential functions. The employment of such a predicate would always presuppose a constituted world. Therefore it would be nonsense to speak of the confirmation of natural laws (which correspond to the very meaning-rules of the language to the expressions of which the predicate "confirmed-to-degree-n" is applied).

by the relation *coex*, (3) which sub-set consists of sentences *verified in the story*.

Sentence "*p*" will be said to be a *sentence verified in story S* if *S* includes a sentence "*q*" and a sentence "*r*" such that "*q*" designates *r coex p*, where *r* is a token of "*p*." Sentences "*q*" and "*r*" will be said to be the experiential tie of "*p*," and *r* the verifying token of "*p*." Each sub-set of verified sentences as characterized above will be called a *verification base* of the story *S*.

The references to *designata* in these definitions make it necessary to come to a final reckoning with naïve realism. We have already pointed out that the expression "the world" must be interpreted in such a way as to avoid the ontological fallacy. We suggested that the expression contains an implicit reference to a language, and has the sense of "the world meant by . . . a given language." Are we saying that the rejection of the ontological fallacy involves the notion that there are many *real* worlds? Indeed not! The final abandonment of naïve realism comes with the realization that "talking about the *designata* of sentences" is an essential ingredient in "characterizing these sentences in terms of epistemological predicates." The "right-hand side" of designation sentences together with the predicate "designates" and the quotation marks on the "left-hand side" are all alike formal devices belonging to the grammar of epistemological predicates; their function is the purely formal one of hooking up with the rules relating to the assignment of such predicates as "true sentence of (language) *L*," "verified sentence of *L*," etc. If we introduce the term "world" as a collective term for the designata of a world-story, then it is a purely formal truth that every world-story in every empirically meaningful language designates a world. The pure theory of empirically meaningful languages as formally defined systems which are about worlds in which they are used, has no place for *the* world, but only for the world designated by the story which is the meaning-base of a given language.[22]

[22] Once we appreciate the fact that epistemologically it makes no sense to speak of *the* world, it becomes possible to explore certain traditional controversies with the hope of discovering what, if anything, is at stake. Different languages are characterized by different conformation rules; different conformation rules are reflected in differences in the structures of stories formulated in these languages, and of the worlds these stories are about. Epistemology, or the pure theory of empirically meaningful languages, can develop the formal properties of languages with different conformation rules, but can not "choose" *the* story or *the* language. Epistemology can show, or expose the formal confusion that underlies attempts to show, that one or other type of story or language is internally inconsistent. In this sense, and in this sense alone, can it defend or attack "realism," "idealism," or some other epistemological "ism."

A few definitions by way of crystallizing certain expressions we have used in the course of our argument follow:

A calculus (with specified conformation rules) which permits the formulation of expressions which conform to the defining requirements of a confirmed world-story, will be called an *empirical language form*. The notion here is that as far as the predicates of a language are concerned, there can be a family of world-stories involving those predicates (a family of worlds involving the same qualities-laws, but different "initial" conditions).

An empirical language form pinned down to one of these world-stories, and hence for which the formal status (and hence the meanings) of its individual constants is fixed, will be called an *empirical* (or *empirically meaningful*) *language*. The world-story which fixes the individual constants will be called the *meaning-base* of the language.

The individual constants and (primitive) predicates of empirical language L will be said to be *meaningful expressions of* L, as will (atomic) sentences constructed of them. The *designata* of meaningful individual constants and predicates will be said to *exist* in the world of the language. This sense of existence in which individuals and classes exist is to be distinguished from the sense in which it is said that *lions* (as opposed to the *class* lion) exist. The former is correlated with "meaningful," the latter with "true."

A meaningful sentence of L which belongs to the story S which is the meaning-base of L will be said to be *confirmed in* S, and to be a *confirmed sentence of* L.

A meaningful sentence of L which belongs to a verification base of S, will be called a *verified sentence of* L.

A predicate which appears in at least one verified sentence of L will be called a *datum-predicate* of L. A meaningful predicate of L which appears only in confirmed sentences of L, will be called a *non-datum predicate* of L.

The notion that the primitive predicates of an empirically meaningful language *must* be datum-predicates, and that its basic sentences *must* be verified sentences, is psychologism pure and simple, and not even good psychologism at that. The psychologism which is classical pragmatism (Dewey) has sounder instincts than the sensationalistic pragmatisms which have listened to Hume, Mach, and some of the earlier tales from the Vienna Woods. It is, however, an analytic truth that an empirically meaningful language is empirically meaningful as resting on a verification base, a set of verified sentences which uniquely determine the language in the complicated way we have indicated.

The conclusion to which we have come is that since, from the standpoint of the pure theory of languages, the notion of an empirically meaningful language includes the notion of a confirmed world-story which is the meaning-base of the language, *sentences assigning epistemological predicates to the expressions of an empirically meaningful language are either analytic or self-contradictory*. Thus, the sentence "'p' is a (*factually*) true sentence of L" is itself *logically* true (or false). To say this, is not to *identify* semantic truth with syntactical or logical truth. It is only to say that (in principle) the semantic predicate "(factually) true" is formally decidable. The predicate "(factually) true"

is characterized by the formal equivalence "'p' is true if and only if p." But *that the world designated by the story which is the meaning-base of L includes (or fails to include) state of affairs p* is a matter of logical truth (or falsity). Just as the notion of *the* world is a mistake, so is the notion of *the* set of true sentences. To see that "(factually) true" as well as "designates" is *in principle* formally decidable, is to take the final step away from both naïve realism and psychologism. Clearly, however, we must explain our frequent use of the expression "in principle." We shall use it once more, and then make the explanation of it the final point on our agenda.

We have been contending, in general, that where E is a linguistic expression, and "ϕ" an epistemological predicate, the sentence "$\phi(E)$" entails "E belongs to language L of which the meaning base S designates world W," and that the truth or falsity of "$\phi(E)$" is formal truth or falsity, decidable, in principle, on purely formal grounds. Speaking loosely but suggestively, we would say that the "attribution" of epistemological predicates to an expression implies that the expression belongs to a formal system constituted in such a way that the sentence making this attribution is either analytic or self-contradictory. This is what we mean when we say that the use of epistemological predicates involves (*logically* involves) *presuppositions*.

"But surely," it will be said, "the construction of world-stories and the deciding with respect to them that sentences of the kind '"p" is (factually) true' are analytic or self-contradictory, lies completely beyond our powers! What possible connection can there be between such a mathematician's dream, and our humble use of epistemological terms?" The answer (like the answer to all good philosophical questions) is hidden in the question, and concerns the distinction between "perfect" and "imperfect" languages, and its implications for the sense of formal predicates.[23]

The most fruitful way of looking at this distinction is to consider the rôle of variables in these languages. A perfect language is one which includes no variable (individual or predicate) for which it does not contain an explicit domain of values. Thus, a perfect language is one in which a universal proposition can be translated into a logically equivalent conjunction of singular propositions. An imperfect language is one in which universal propositions can not be so translated, but must make use of ampersands and dotted lines; in it, therefore, universal propositions are *schemata* rather than shorthand for specifiable logical sums and

[23] At this point the closing sentences of section I and the opening sentences of section II should be re-read.

products. Let us call a perfect language a *language proper*, and an imperfect language, a *language schema*. We should admit that human beings speak a language schema.

Now the contention I wish to make is that the distinction we have been drawing between language schemata and languages proper is a *factual-psychological* rather than a *formal-epistemological* distinction. As I have put it elsewhere,[24]

> [this distinction] belongs to the psychology of formal *manipulations*, and can no more be formulated in terms of formal concepts, than can the concept of *mistake*. If this is the case, then our factual inability to construct complete world-stories no more entails an inability to give a formal account of a complete world-story, or of a language proper, or to presuppose structures of this kind, than our inability to construct an infinite series entails an inability to give a formal account of infinity, or, indeed, of particular infinite series. Our everyday use of epistemological predicates is *formally* sensible, even though we cannot turn it into petty cash.

It is in view of these considerations that we can understand how it is that as formal scientists we must say that the use of epistemological predicates presupposes a complete world-story in a perfect language, while yet recognizing the blundering status of the human animal.

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COMMENTS AND CRITICISM

TRANSACTION VS. INTERACTION

A seemingly new direction in Dewey's thought has been signalized recently by a series of articles, written in collaboration with Arthur F. Bentley and currently appearing in this JOURNAL, in which the conception of "transaction" is used to supplement (with the implication that it may ultimately replace) that of "interaction." Though the full implications of this latest development have not yet been made entirely clear, enough has been written to stimulate thought and to call forth a number of questions.

Bentley and Dewey (the former seems to be the active member in the collaboration, with Dewey acting as critic and censor) feel that "trans-action" is the next level to which the organization of inquiry must proceed, basing this insistence on a historical evolutionary analysis in which the development of modern sci-

[24] "Realism and the New Way of Words," *Philosophy and Phenomenological Research*, forthcoming. See also "Pure Pragmatics and Epistemology" in *Philosophy of Science*, Volume 14 (1947), pp. 195–197.

ence is seen as having gone through three stages, characterized in turn by (1) "self-action," (2) "inter-action," and (3) "trans-action." The differences between interaction and transaction are variously stated. For example, when using the latter approach they are asserting "the right to see together, extensionally and durationally, much that conventionally is talked of as if composed of irreconcilable separates."[1] In a later passage of the same article, interaction is described as "presentation of particles or other objects organized as operating upon one another," and transaction as "functional observation of full system, actively necessary to inquiry at some stages, held in reserve at other stages, frequently requiring the breaking down of older verbal impactions of naming."[2]

In a later article, entitled "Interaction and Transaction,"[3] this distinction is developed further and exemplified in the history of modern physics; here the further point of clarification that is added distinguishes the method of transaction as eliminating the treatment of "things" and "relations" as isolated or detachable.[4] In a third article, entitled "Transactions as Known and Named,"[5] a host of other distinctions is introduced and additional examples are given from the biological and psychological sciences.

We can not help but wonder, on the basis of the material before us, whether Dewey (or his collaborator) may not be beating something of a dead dog, at least in so far as the implied criticism of "interaction" is concerned. In a footnote to the "Interaction and Transaction" article, reference is made to "Dewey's early employment of the word 'transaction' . . . to stress system more emphatically than could be done by 'interaction,' " and the beginnings of this "attitude" are traced to Dewey's famous paper on "The Reflex Arc Concept in Psychology" (1896).[6] The "transactional" attitude, in other words, has always been present in Dewey; the new discovery heralded by these articles would seem, therefore, to be terminological chiefly.

However, this sudden and drastic reinterpretation of terms may lead students of Dewey's thought into embarrassing difficulties. Thus, we find the distinction made, with respect to Activity, that

> If inter-action views things as primarily static . . . then *Trans-action* regards extension in time to be as indispensable as is extension in space (if

[1] "A Terminology for Knowings and Knowns," this JOURNAL, Vol. XLII (1945), pp. 242–243.

[2] *Ibid.*, p. 246.

[3] This JOURNAL, Vol. XLIII (1946), pp. 505–517.

[4] *Ibid.*, p. 509.

[5] This JOURNAL, Vol. XLIII (1946), pp. 533–551.

[6] *Op. cit.*, p. 509, note 9.

observation is to be properly made). . . . Or with special attention to the case of organism and environment. If inter-action assumes the organism and its environmental objects to be present as substantially separate existences or forms of existence, prior to their entry into joint investigation, then—

Trans-action assumes no pre-knowledge of either organism or environment alone as adequate, not even as respects the basic nature of the current conventional distinctions between them, but requires their primary acceptance in common system, with full freedom reserved for their developing examination.[7]

In the first place, this is *not* the manner in which Dewey has used the term "interaction" in those of his writings with which we have long been familiar. He has never treated the interacting elements as "static," nor has he ever spoken of organism and environment as "substantially separate existences"; in fact, the whole force of his earlier use of the term was in the opposite direction. It is somewhat disconcerting to find the useful concept of "interaction" twisted out of the contexts and use with which we have become familiar and made the whipping-boy of a new and chiefly terminological "discovery."

In the second place, the concept of interaction still seems to be the more useful one, even in many of the examples of "transaction" cited, simply because it implies a recognition of the obvious and fundamental polarities in experience. No matter how tentative or relativistic our process of inquiry may become, some elementary distinction between the subject and the object, the organism and the environment, the knower and the known, will, or should, remain. Of course, these will usually be found "fused," or at least mingled, in a complex fashion; but, retaining Dewey's more familiar picture of dynamic and inseparable elements to begin with, the term "interaction" seems to provide a more accurate description of experience and of the process by which "organisms" come to know their "environments." The fundamental importance of the omnipresent subject-object polarity is evident from the fact that its absence in atomic physics has radically altered our conception of knowledge in that field, introducing the element of indeterminism: we can not *know* the electron because we can not *interact* with it.[8]

"Transaction," when used to refer to the process of inquiry, stresses, quite properly, the mutual involvement of the "knower" and the "known" in a "full system" of great complexity; but "interaction" reminds us that the former element can never be eliminated and must be abstracted if we are to achieve objectivity. When focused on the environment, this concept is also useful as a

[7] "Transactions as Known and Named," *op. cit.*, p. 536.

[8] P. W. Bridgman, "The New Vision of Science," *Harper's Magazine*, March, 1929.

formulation of the *ideal goal* of science, which is to describe the "transactions" of nature as far as possible in themselves, independent of the various qualities lent them by individual experience; but, again, "interaction" reminds us that this is a goal which can never be perfectly achieved, because of the inevitability of "point of view."

Our goal is to define the relations between experience and existence with precision; "transaction," properly stressing the continuity of man and nature, but doing so at the expense of the necessary distinctions included in "interaction," tends to confuse and blur them.

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A TRANSACTION WITH MR. KAHN

The argument that is marshaled in defense of interaction as against transaction runs something like this: (1) Since interaction "implies a recognition of the obvious and fundamental polarities in experience," (2) in view of Professor Dewey's hitherto wide usage of the term, its retention would be highly desirable. Clearly, no disagreement exists as to the activist analysis. It centers rather about the preposition of activity, about the position of the objective configurations in their patterned movement with respect to that analysis. Mr. Kahn emphasizes the bipolar relation between organism and environment, and by-passes the other ongoing processes outside of this organized environment. Messrs. Dewey and Bentley would regard interaction as a misleading concept that misrepresents the character of natural activities, some of which involve human knowledge and others which escape our attention. Transaction is proposed as a leading concept to indicate at once the liberation of part of the environment from human experience and their closer union where the environment is experienced and known.

The criticism of this concept is wide of the mark, and this, whether or not transaction is the fitting term for methodological purposes.

(1) The polarity of organism and environment is a logical distinction made during the logical phase of experience; the environment is not swallowed up by experience, but both are simultaneously signified during this logical phase. At first blush, this distinction may appear obvious for the nature of human experience, but it is hardly fundamental for the nature of unexperienced nature. It has no priorities over the host of distinctions that have graced the history of philosophy, since its intralogical and post-

logical status is similar to theirs. Before inferential inquiry, brute existences move on in whatever patterns accommodate them. The patterned movement of molecular entities becomes a world of rolling stones and falling rain only after the entities have been named and qualified during inquiry. Some objective configurations are found in nature and others are ideally organized in order to control their movement and expedite human purposings when the idea is acted upon. To turn around after the inquiry and state that these logical products existed prior to the specific logical operations is the sheerest of metaphysical fallacies; that they are potentially there before the cognitive activity ensues and that this activity follows the lead of the brute existences is a totally different sort of statement. The first springs from the idealist confusion of epistemology and metaphysics, while the second is the naturalist's way of avoiding that confusion and breaking out of the idealist predicament. The espousal of the newer transaction serves not so much to get out of this confusing predicament, for that has already been accomplished in the controversies of yesteryear, but rather to reinforce the new position by getting rid of the experience-centered and dualistic innuendoes of interaction. Besides setting the organism off against the environment, the latter would anticipate extending the environment beyond our experience of it, and make that extension dubious; the former has an evenness of focus that provides not only for the experienced environment but for unexperienced patterns in nature as well.

Interaction is considered "more useful . . . simply because it implies a recognition of the obvious and fundamental *polarities* in experience, the subject and object, the organism and the environment, the knower and the known" (my italics). And yet what is presented is but a single polarity; a moment's reflection discloses that the three pairs enumerated are but different aspects of one and the same polarity. If the possibility of *polarities* in experience be recognized, and even of pluralities that aren't mentioned, then this unswerving adherence to interaction is puzzling; for *polarities* have been eliminated from the very outset by assigning their possibility to interaction; the polarity of organism and environment hasn't the privileged status of absolutely anteceding the other polarities, as well as the unities and pluralities, disclosed during special inquiries. These limitations undermine interaction as a controlling concept, for it leaves much to be desired by a realistic naturalism that shuns idealism, passive formalism, and dualism. The sooner their terminological innuendoes are read out of the language of contemporary naturalism by the use of transaction, or of another suitable term that engenders this anti-formalist, anti-

dualist significance, the easier it will be to curtail their persistence in philosophic discussion.

(2) The introduction of transaction has a clarifying office. If the term doesn't clarify, a different one should be proposed instead of defending the regressive one. The transaction *of* organism *with* environment Professor Dewey considers preferable to the interaction *between* them, if only because it underscores the continuity of nature with human nature and preserves the integrity of unexperienced nature from idealist excesses. It is significant that neither the naturalist attitude nor the activist analysis changes, but only the language is altered, the better to label that attitude and analysis. One of Professor Dewey's greatest difficulties arose from the fact that his reconstruction was entrapped by a philosophic vocabulary that fitted precisely the analysis he was displacing. So that if the "omnipresence" of interaction in his writings is bothersome, its bothersomeness would become doubly increased if either the displaced dualism or the exclusively formal problem of knowledge were reinstated as a major theme; or if the "subject-object" polarity itself became "omnipresent."

There is a patent advantage in calling things by their right names, and the rechristening of leading principles by the founder of experimental naturalism is to be welcomed where those principles are made clearer. For those who find the older epistemologies and metaphysics more congenial, these clarifications will fall on deaf ears, as the disagreement runs much deeper than mere terminology and deserves a more thorough treatment. But Mr. Kahn, a student of Professor Dewey's writings, sees that transaction is not a recent contrivance championed to satisfy some passing whim, that it has been in use since the reinterpretation of the reflex arc concept in 1896. That article is perhaps the most important one of the middle 'nineties, for it signalized the final shaping of a thoroughly active philosophy of experience. It supplemented the Jamesian stream of thought with a stream theory of conduct; just as thought was no longer the product of discrete inexplicables called sensations, so conduct no longer depended on the mechanical push-pull of stimulus and response by some trans-empirical subject as cause or organizer of the concrete act. The James-Dewey collaboration here opened up new frontiers in the philosophy of experience, and transaction was a tool in that advancement.

And this brings us to the crucial advantage which Mr. Kahn also seems to recognize, a recognition that blunts the intent of his criticism. " 'Transaction' . . . stresses, quite properly, the mutual involvement of the 'knower' and the 'known,' " and this is what was intended with reference to inquiry; we are not told how it

does so "at the expense of the necessary distinctions included in 'interaction,'" or why it "tends to confuse and blur them." Nor are we told how to deal with instances where the polarity of organism and environment may be irrelevant to the purposes of our inquiry. Since transaction would suit these inquiries where interaction is inadmissible, and stressing as it does the "mutual involvement" that interaction might vitiate, then surely the term of wider reach and greater accuracy is the better one.

Our aim is to further philosophic inquiry and not to paralyze it with a terminology that is shot through with a prescientific psychology and its attendant philosophies. Rather than forestall the quest for an improved terminology, we should seek to sustain the activist-experimentalist philosophy of experience. It would be more instructive to work through basic concepts still current in contemporary naturalism that are the counterfeit coin of a bygone intellectual stamp, as further terminologic and analytic refinements are in order. Perhaps this enterprise is not as satisfying as hair-splitting disputation, but it should prove more rewarding.

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BOOK NOTES

Studies and Essays in the History of Science and Learning Offered in Homage to George Sarton on the Occasion of his Sixtieth Birthday. Edited by M. F. ASHLEY MONTAGU. New York: Henry Schuman. 1947. xiv + 597 pp. $12.00.

The manuscript of this book was presented to Dr. Sarton in 1944 on his sixtieth birthday, its actual publication being delayed by the war for the better part of three years. The twenty-seven contributions celebrate in a fitting fashion the great stimulus Dr. Sarton has supplied, by precept and example, to the study of intellectual history. A brief biographical note provides the essential data on his scholarly career and achievements.

The contributions are of unequal interest to the general philosophical reader, they range over a wide area of subjects, and they vary considerably in merit. Most of the essays deal with special figures or with detailed technical developments in the history of the physical, biological, and cultural sciences; but a number of them address themselves to general themes connected with the influence of science upon phases of civilization. None of the articles attempts a sociological or economic interpretation of intellectual history.

Only a few of the contributions to the volume can be explicitly noticed here. The essay most interesting to the present reviewer is the late Professor Cassirer's "Galileo's Platonism." According to him, though Galileo must be regarded as a Platonist, his was "not a metaphysical but a physical Platonism," a standpoint distinctive of Galileo and "unheard of" before his time. Professor Cassirer recognizes the continuity of Galileo's thought with that of the past, and is prepared to admit that Galileo was influenced by the logical treatises of the Padua school; he nevertheless rejects the conclusion that the inspiration for Galileo's scientific work came from the Aristotelianism centered at Padua or Paris, and maintains that on the contrary "His thought is, directly and immediately, connected with Plato, with Eudoxus and Euclid, not with Jean Buridan or Nicolas d'Oresme." Professor Cassirer's paper exhibits its author's characteristic wide learning and judicious temper in handling a complex and difficult problem. Another essay likely to attract the philosophical reader is Professor Lenzen's "Helmholtz's Theory of Knowledge." It furnishes a brief but careful statement of Helmholtz's philosophy of science, hitherto not available in English; and it calls attention to the views of an outstanding nineteenth-century figure that are still important and that have been undeservedly neglected by Anglo-American students of scientific method. A paper by Agnes Arber on "Analogy in the History of Science" contrasts in an interesting manner the use of analogies in medieval and modern science, and points up the familiar but still frequently neglected difference between the justifiable employment of analogies as heuristic devices and the dubious worth of analogies as warranted grounds for inference—Samuel Butler's speculations on memory and heredity being cited, among others, as illustrating the confusion of analogy with strict identity. Grant McColley's "Humanism and the History of Astronomy" pays tribute to the influence of astronomical ideas upon men's conceptions of their place in nature. M. Delevsky's "L'Idée du Cycle Éternel dans l'Histoire du Monde" brings together much ancient and modern discussion of the alleged eternal recurrence of world history, and makes explicit the basic assumption on which that conception is founded. This assumption —that the number of possible combinations of the elements out of which actual events are constituted is finite—M. Delevsky believes has never been established and is unlikely ever to be demonstrated; accordingly, he rejects on this ground as well as for other reasons not so persuasive the doctrine of eternal recurrence, and he also dismisses as inadequate teleological theories of cosmic history. In "A Few Notes on Egyptian and Babylonian Mathematics," Dr.

Solomon Gandz offers a revaluation of the relative merits of Babylonian and Egyptian achievements in pure science, and shows that on the basis of recent researches the superiority of the former over the latter must be acknowledged.

Dr. Montagu's "Suggestions for the Better Correlation of Literature and Science" is a plea for greater attention to the impact of scientific ideas on literary productions. It is a plea which undoubtedly has merit, though the reader is often left wondering how illuminating or significant some of the suggested "correlations" really are—for example, the fact cited by Dr. Montagu that Chaucer wrote a treatise on the astrolabe is of trivial importance for any evaluation or appreciation of Chaucer's writings. In his "Positivism and the Technocratic Ideal in the Nineteenth Century" Dr. de Santillana contributes an interesting though impressionistic discussion of the ideas on social planning of such men as Comte, St. Simon, Enfantin, and Proudhon. But it is a pity he has adopted the method of half-statement and innuendo rather than that of explicit formulation in his comparison of eighteenth- and nineteenth-century conceptions of "technocracy" or in his imputation of a "fundamental philosophic contradiction" to the positivism of the nineteenth century. Chauncey D. Leake's "Ethicogenesis" is a surprisingly uncritical discussion of the nature and source of moral principles. The author believes that it is possible to discover "a naturally operative principle that governs human conduct" which has "the same character as the principle of gravity." And he offers on the basis of "biological evidence" the following banal and highly ambiguous dictum as a tentative statement of such a principle: "The probability of survival of a relationship between individual humans or groups of humans increases with the extent to which that relationship is mutually satisfying." The paper "On the Infinite Number of Infinite Orders. A Chapter of the Pre-History of Transfinite Numbers" by Professor Schrecker discusses some alleged anticipations of the Cantorian theory of transfinite cardinals in several writers of the seventeenth and eighteenth centuries. While the materials cited are very interesting, the attribution of even the germ of Cantor's ideas to Fontenelle seems to this reviewer quite far-fetched. Professor Schrecker makes a slip in identifying *Aleph-one* with the cardinality of the continuum. And his "warning" to positivists not to "sever science from metaphysics and theology," on the ground that in the history of science many productive ideas had their origin in theological and metaphysical speculation, is a bit of gratuitous irrelevance and a good example of the genetic fallacy.

E. N.

Filosofi Italiani del Quattrocento. EUGENIO GARIN. (*Istituto Nazionale di Studi sul Rinascimento.*) Florence: Le Monnier. 1942. vi + 553 pp. 65 lire.

Eugenio Garin, whose studies of Pico and other Renaissance philosophers are well known to scholars in the field, has collected in this volume an unusually large and diversified number of Latin texts, with Italian translations on the side, selected from the works of Italian humanists and philosophers of the early Renaissance. The authors represented are: Coluccio Salutati, Leonardo Bruni, Poggio Bracciolini, Cosma Raimondi, Francesco Filelfo, Lorenzo Valla, Bartolomeo Fazio, Giannozzo Manetti, Leon Battista Alberti, Matteo Palmieri, Bartolomeo Platina, Bessarion, Marsilio Ficino, Cristoforo Landino, Ermolao Barbaro, Angelo Poliziano, Giovanni Pico, Ludovico Lazzarelli, Pletho, Donato Acciaiuoli, Lorenzo de' Medici, Girolamo Savonarola, Alamanno Donati, Giovanni Nesi, Egidio de Viterbo, Nicoletto Vernia, Elia del Medigo, Girolamo Donato e Giovanni Pontano. The passages are well selected, often from rare old educations or from manuscripts, and accompanied by informative notes. An introduction (pp. 1–75) surveys the intellectual currents of fifteenth-century Italy. Students of Renaissance philosophy and literature will be grateful for this useful volume which brings together a large amount of interesting material most of which had not been accessible in any modern edition.

P. O. K.

The Roots of Our Learning. Eleven Essays. FRANCIS NEILSON. New York: Robert Schalkenbach Foundation. 1946. ix + 297 pp. $3.00.

The author of these loosely connected essays—actor, producer, parliamentarian, traveler, and man of letters—is a *dilettante* in the honorable sense of the word. The variety of topics dealt with is great, the occasion for writing is generally provided by a book which aroused the author's interest, and the unifying theme is a preoccupation with the values of British history and Christian tradition. The worst that can be said about these essays is that they are slight, the best that they reveal an intelligent reverence for the past.

H. K.

OTHER NEW BOOKS AND JOURNALS

Foote, Henry Wilder: Thomas Jefferson: Social Reformer. (Beacon Reference Series.) Boston: The Beacon Press. 1947. 15 pp. 25¢.

Carrithers, Walter A., Jr.: The Truth about Madame Blavatsky. (Supplement to The Theosophical Forum, April, 1947.) Covina, California: Theosophical University Press. 27 pp. 50¢.

Philosophisches Wörterbuch. HEINRICH SCHMIDT. 8th edition. New York: Mary S. Rosenberg. 1945. 476 pp. $3.50. (The last pre-Nazi edition of this useful philosophical dictionary, published by Alfred Kröner in Leipzig in 1931, has been reproduced in photo-reprint by authority of the Alien Property Custodian, thus making the book easily accessible to American students of philosophy who read German.)

MIND. Vol. LVI, No. 224. Sense Data and Judgment in Sensory Cognition: *C. A. Campbell.* "Social Engineering": *R. Rhees.* Will the Future be like the Past?: *F. L. Will.* Discussions—On a Certain Modal Proposition: *C. H. Langford.* On Paradoxes of the Type of the Epimenides: *C. H. Langford.* Virtue, Obligatoriness and Rightness: *J. E. Ledden.*

THE PHILOSOPHICAL REVIEW. Vol. LVI, No. 5. Recent Poets on Man and his Place: *Katharine Gilbert.* A Defense of Substance: *E. J. Nelson.* The Rôle of the Philosopher: *Marten ten Hoor.* Proceedings of the American Philosophical Association. Discussion—Freedom and Reform: *G. H. Sabine.* Beauty Defined: *A. J. Bahm.*

PHILOSOPHY OF SCIENCE. Volume 14, Number 4. Methodology of Research and Progress in Science: *Erwin Biser* and *E. E. Witmer.* The Locus of Mathematical Reality: *L. A. White.* An Experimental Measure of Personality: *C. W. Churchman* and *R. L. Ackoff.* A Categorial Analysis of Value: *E. W. Hall.* Commentary Ethics and Social Science: *J. Somerville.*

We print below a list of selected articles from the following publications:

JOURNAL OF THE HISTORY OF IDEAS. Vol. VIII, No. 4. Form and Content in Plato's Philosophy: *Philip Merlan.* A Note on the Origin and Problem of Leibniz's Discourse of 1686: *L. E. Loemker.* The Idea of Interpretation in Hebrew Thought: *Solomon Simonson.* Sigwart's *Logik* and William James: *R. B. Levinson.*

THE HIBBERT JOURNAL. Vol. XLVI, No. 1. The Laughter of God: *S. H. Mellone.* Does God, or Man, Need to be Justified: *F. H. Heinemann.* A Fifth-Century Apostle of Free Will: *A. H. Birch.* Lewis Carroll: Philosopher: *C. J. Woollen.* Ethics, Human and Divine: *Perovsky-Petrovo-Solovovo.*

RIVISTA DI FILOSOFIA NEO-SCOLASTICA. Anno XXXIX, Fasc. III. L'indagine probabilistica della natura: *P. Dore.* L'idea dell'essere da Parmendide ad Aristotele: *G. Di Napoli.* Eraclito in

Giustino: *L. Alfonsi.* Studi protrettici e filosofici nell' "Epistola a Diogneto": *L. Alfonsi.*

REVUE DES SCIENCES HUMAINES Fasc. 46. Antifinalisme et finalité chez Lucrèce: *P. Mesnard.*

SCIENTIA. Vol. LXXXI, N. CDXXI–XXII. Considerazioni critiche sul problema del cosidetto finalismo biologico: *E. Poli.* The Foundations of Thermodynamics: *J. R. Partington.* Systématisation scientifique de la philosophie: *A. Natucci.*

THE KENYON REVIEW. Summer, 1947. Two More Existentialists: Karl Jaspers and Gabriel Marcel: *Marjorie Grene.* "Not Men": A Natural History of American Naturalism: *Malcolm Cowley.* (Autumn, 1947.) On the Agenda of Political Theory: Post-War Stock-Taking, IV: *P. A. Palmer.*

COMMENTARY. Vol. 4, No. 4. The Study of Man. Liberating the Social Scientist: *John Dewey.*

SIGMA. No. 3, 1947. Arte e conoscenza in Jean-Paul Sartre: *Vittorio Somenzi.* Elementi per una teoria della conoscenza—III: *Giuseppe Vaccarino.* L'esperimento nella scienza, nella filosofia, nella religione: *A. Aliotta.*

NOTES AND NEWS

The Conference on Methods in Philosophy and the Sciences will meet December 7, 1947, at the New School for Social Research, New York City. The subject of the morning session will be "The Theory and Practice of History" with the following papers: "History and the Philosophy of History" by Maurice Mandelbaum; "The Great Historian and the Meaning of Truth" by Kurt Riezler; Discussion by Sidney Hook. At the afternoon session the subject will be "American Public Policy on Science: A Symposium on the Report of the President's Scientific Research Board." The papers are as follows: "The National Planning of Science" by Robert F. Steadman; "Scientific Freedom and National Planning" by P. W. Bridgman; "Science and Secrecy" by James R. Newman.

Section L of the American Association for the Advancement of Science on the History and Philosophy of Science will meet in Chicago, Illinois, December 27 and 28, 1947. The program is as follows:

Morning Session, December 27, Symposium on "Foundations of Modern Physics," Joint Session with the American Philosophical Association: "The Place of Logic in the Advance of Science" by

Philipp Frank; "Cosmology and Logic" by John Myhill; "Philosophical and Physical Evolution of the Problem of Motion" by Leopold Infeld; "Principles of Impotence in Modern Physics" by R. B. Lindsay; Discussion.

Afternoon Session, December 27, Symposium on "Problems of Concept Formation in Psychology," Joint Session with the Sections on Botanical Sciences, Psychology, Social Economic Sciences, and the American Philosophical Association: "Types of Concepts and Types of Definitions in Psychology" by Herbert Feigl; "The Formation of Concepts in Personality and Dynamic Psychology" by R. B. Cattell; "Diagnostic Concepts in Psychopathology" by Phyllis Wittman; "The Problem of Anxiety; Some Conceptual Difficulties" by C. H. Mowrer; Discussion.

Afternoon Session, December 28, Symposium on "Are Human Social Problems in a Different Category from Integrations of Biology?" Joint Session with Section on Social and Economic Sciences and the American Philosophical Association: paper by A. E. Emerson; "Human Social Problems as a Type of Disintegration in a Biological Integration" by G. A. Lundberg; "The Relations between Biological and Cultural Factors in Social Problems" by F. S. C. Northrop; Discussion.

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